

Figure 1

Anti-CD3 WT

GATATCAAACTGCAGCAGTCAGGGGCTGAACCTGGCAAGACCTGGGGCCTCAGTGAAGATGTCCT
GCAAGACTTCTGGCTACACCTTTACTAGGTACACGATGCACCTGGGTAACAGAGGCCCTGGACA
GGGTCTGGAATGGATTGGATACATTAATCCTAGCCGTGTTATACTAATTACAATCAGAAATT
AAGGACAAGGCCACATTGACTACAGACAAATCCTCCAGCACAGCCTACATGCAACTGAGCAGCC
TGACATCTGAGGACTCTGCAGTCTATTACTGTGCAAGATATTATGATGATCATTACTGCCCTTGA
CTACTGGGCCAAGGCACCACTCTCACAGTCTCCTCAGTCGAAGTGGAAGTGGAGGTTCTGGT
GGAAGTGGAGGTTCAAGTGGAGTCGACGACATTCAGCTGACCCAGTCTCCAGCAATCATGTCTG
CATCTCCAGGGAGAAGTCAACCATGACCTGCAGAGCCAGTTCAAAGTGTAAATTACATGAACCTG
GTACCAGCAGAAGTCAGGCACCTCCCCAAAAGATGGATTATGACACATCCAAAGTGGCTTCT
GGAGTCCCTTATCGCTTCAGTGGCAGTGGTCTGGGACCTCATACTCTCACAAATCAGCAGCA
TGGAGGCTGAAGATGCTGCCACTTATTACTGCCAACAGTGGAGTAGTAACCCGCTCACGTTCCG
TGCTGGGACCAAGCTGGAGCTGAAA

AA Sequence

DIKLQSGAELARPGASVKMSCKTSGYTFTRYTMHWVKQRPQGLEWIGYINPSRGYTNYNQKF
KDKATLTTDKSSSTAYMQLSSLTSEDSAVYYCARYYDDHYCLDYWGQGTTLTVSSVEGSGSG
GSGSGGVDDIQLTQSPAIMASAPGEKVTMTCRASSSVSYMNWYQQKSGTSPKRWIYDTSKVAS
GVPYRFSGSGSGTSYSLTISSMEAEDAATYYCQQWSSNPLTFGAGTKLELK

Fig. 2 A

VH2

DVQLVQSGAEVKKPGASVKVSCKASGYTATRYTMHWVRQAPGQGLEWIGYINPSR
GYTNYAQKLQGRVTMTTDTSTAYMELSSLRSEDATYYCARYYDDHYCLDYWG
QGTTVTVSS

VH3

DVQLVQSGAEVKKPGASVKVSCKASGYTATRYTMHWVRQAPGQGLEWIGYINPSR
GYTNYAQKLQGRVTMTTDTSTAYLQMNSLKTEDTAVYCYARYYDDHYCLDYWG
QGTTVTVSS

VH5

DVQLVQSGAEVKKPGASVKVSCKASGYTFTRYTMHWVRQAPGQGLEWIGYINPSR
GYTNYADSVKGRFTITTDKSTAYMELSSLRSEDATYYCARYYDDHYCLDYWG
QGTTVTVSS

VH7

DVQLVQSGAEVKKPGASVKVSCKASGYTFTRYTMHWVRQAPGQGLEWIGYINPSR
GYTNYNQKFKDRVTITTDKSTAYMELSSLRSEDATVYCYARYYDDHYCLDYWG
QGTTVTVSS

Fig. 2 A (cont.)

VL1

DIQMTQSPSSLSASVGDRVTITCRASQVSVMNWYQQKPGKAPKRWIYDT
SKVASGVPARFSGSGTDYSLTINSLEAEDAATYYCQQWSSNPLTFGGG
TKVEIK

VL2

DIVLTQSPATLSLSPGERATLSCRASQVSVMNWYQQKPGKAPKRWIYDT
SKVASGVPARFSGSGTDYSLTINSLEAEDAATYYCQQWSSNPLTFGGG
TKVEIK

VL3

DIVLTQSPATLSLSPGERATLTCRASSVSVMNWYQQKPGKAPKRWIYDT
SKVASGVPARFSGSGTDYSLTINSLEAEDAATYYCQQWSSNPLTFGGG
TKVEIK

Fig. 2 B

VH2

GACGTCCAACTGGTGCAAGTCAGGGGCTGAAGTGAAAAACCTGGGGCCTCAGTGAAGGTGTCTCTGC
AAGGCTTCTGGCTACACCGCTACTAGGTACACGATGCACCTGGTAAGGCAGGCACCTGGACAGGGT
CTGGAATGGATTGGATACATTAACTCCTAGCCGTGGTTATACTAATTACGCACAGAAAGTTGCAGGGC
CGCGTCACAATGACTACAGACACTTCCACCAGCACAGCCTACATGGAACTGAGCAGCCTGCCGTTCT
GAGGACACTGCAACCTATTACTGTGCAAGATATTATGATGATCATTTACTGCCTTGACTACTGGGGC
CAAGGCACCAACGGTCACCGTCTCCTCA

VH3

GACGTCCAACTGGTGCAAGTCAGGGGCTGAAGTGAAAAACCTGGGGCCTCAGTGAAGGTGTCTCTGC
AAGGCTTCTGGCTACACCGCTACTAGGTACACGATGCACCTGGTAAGGCAGGCACCTGGACAGGGT
CTGGAATGGATTGGATACATTAACTCCTAGCCGTGGTTATACTAATTACGCACAGAAAGTTGCAGGGC
CGCGTCACAATGACTACAGACACTTCCACCAGCACAGCCTACCTGCAAAATGAACAGCCTGAAAACCT
GAGGACACTGCAGTCTATTACTGTGCAAGATATTATGATGATCATTTACTGCCTTGACTACTGGGGC
CAAGGCACCAACGGTCACCGTCTCCTCA

VH5

GACGTCCAACTGGTGCAAGTCAGGGGCTGAAGTGAAAAACCTGGGGCCTCAGTGAAGGTGTCTCTGC
AAGGCTTCTGGCTACACCTTTACTAGGTACACGATGCACCTGGTAAGGCAGGCACCTGGACAGGGT
CTGGAATGGATTGGATACATTAACTCCTAGCCGTGGTTATACTAATTACGCACAGACCGTCAAGGGC
CGCTTACAATCACTACAGACAAAATCCACCAGCACAGCCTACATGGAACTGAGCAGCCTGCCGTTCT
GAGGACACTGCAACCTATTACTGTGCAAGATATTATGATGATCATTTACTGCCTTGACTACTGGGGC
CAAGGCACCAACGGTCACCGTCTCCTCA

Fig. 2 B (cont.)

VH7

GACGTCCAACTGGTGCAAGTCAGGGGCTGAAGTGAAAAACCTGGGGCCTCAGTGAAGGTGTCCTGC
AAGGCTTCTGGCTACACCTTTACTAGGTACACGATGCACCTGGGTAAGGCAGGCACCTGGACAGGGT
CTGGAATGGATTGGATACATTAAATCCTAGCCGTGGTTATACTAATTACAATCAGAAAGTTCAAGGAC
CGCGTCACAATCACTACAGACAAAATCCACCAGCACAGCCTACATGGAACTGAGCAGCCTGCCGTTCT
GAGGACACTGCAGTCTATTACTGTGCAAGATATTATGATGATCATTTACTGCCCTTGACTACTGGGGC
CAAGGCACCACGGTCACCGTCTCCTCA

Fig. 2 B (cont.)

VL1

GACATTGATGACCCAGTCTCCATCTAGCCTGTCTGCATCTGTCTGGGACCGTGTCACCATCACC
TGCAGAGCCAGTCAAAAGTGTAAAGTTACATGAAGTGGTACCAGCAGAGCCGGCAAGGCACCCAAA
AGATGGATTATGACACATCCAAAGTGGCTTCTGGAGTCCCTGCTCGCTTCAGTGGCAGTGGGTCT
GGACCGACTACTCTCTCACAATCAACAGCTTGGAGGCTGAAGATGCTGCCACTTATTACTGCCAA
CAGTGGAGTAGTAACCCGCTCACGTTTCGGTGGCGGGACCAAGGTGGAGATCAAA

VL2

GACATTGTAAGTACCCAGTCTCCAGCAACTCTGTCTCTGTCTCCAGGGAGCGTGCCACCCCTGAGC
TGCAGAGCCAGTCAAAAGTGTAAAGTTACATGAAGTGGTACCAGCAGAGCCGGCAAGGCACCCAAA
AGATGGATTATGACACATCCAAAGTGGCTTCTGGAGTCCCTGCTCGCTTCAGTGGCAGTGGGTCT
GGACCGACTACTCTCTCACAATCAACAGCTTGGAGGCTGAAGATGCTGCCACTTATTACTGCCAA
CAGTGGAGTAGTAACCCGCTCACGTTTCGGTGGCGGGACCAAGGTGGAGATCAAA

VL3

GACATTGTAAGTACCCAGTCTCCAGCAACTCTGTCTCTGTCTCCAGGGAGCGTGCCACCCCTGACC
TGCAGAGCCAGTCAAAAGTGTAAAGTTACATGAAGTGGTACCAGCAGAGCCGGCAAGGCACCCAAA
AGATGGATTATGACACATCCAAAGTGGCTTCTGGAGTCCCTGCTCGCTTCAGTGGCAGTGGGTCT
GGACCGACTACTCTCTCACAATCAACAGCTTGGAGGCTGAAGATGCTGCCACTTATTACTGCCAA
CAGTGGAGTAGTAACCCGCTCACGTTTCGGTGGCGGGACCAAGGTGGAGATCAAA

Fig. 2 C

vH CDR1

Wt anti-CD3

VH2, 3

VH5, 7

GYTFTRYTMH

GYTATRYTMH

GYTFTRYTMH

vH CDR2

WT anti-CD3,

VH7

VH5

VH2, 3

YINPSRGYTNYNQKFKD

YINPSRGYTNYADSVKG

YINPSRGYTNYAQKLQG

vH CDR3

WT anti-CD3,

VH2, 3, 5, 7

YYDDHYCLDY

vK CDR1

WT anti-CD3,

VL3

VL1, 2

RASSSVSYMN

RASQSVSYMN

vK CDR2

WT anti-CD3,

VL1, 2, 3

DTSKVAS

vK CDR3

WT anti-CD3,

VL1, 2, 3

QQWSSNPLT

Fig. 2 D

vH CDR1

WT anti-CD3 GGCTACACCTTTACTAGGTACACGATG
CAC

VH2, 3 GGCTACACCGCTACTAGGTACACGATG
CAC

VH5, 7 GGCTACACCTTTACTAGGTACACGATG
CAC

vH CDR2

WT anti-CD3,
VH7 TACATTAATCCTAGCCGTGGTTATACT
AATTACAATCAGAAGTTCAAGGAC

VH5 TACATTAATCCTAGCCGTGGTTATACT
AATTACGCAGACAGCGTCAAGGGC

VH2, 3 TACATTAATCCTAGCCGTGGTTATACT
AATTACGCACAGAAGTTGCAGGGC

VH CDR3

WT anti-CD3,
VH2, 3,
VH5, 7 TATTATGATGATCATTACTGCCTT
GACTAC

Fig. 2 D (cont.)**vK CDR1**

WT anti-CD3,
VL3

AGAGCCAGTTCAAGTGTAAGTTACATG
AAC

VL1, 2

AGAGCCAGTCAAAGTGTAAGTTACATG
AAC

vK CDR2

WT anti-CD3,
VL1-3

ACACATCCAAAGTGGCTTCT

VK CDR3

WT anti-CD3,
VL1-3

CAACAGTGGAGTAGTAACCCGCTCACG

Figure 3**A) anti-CD3 (VH2/VL1)**

GACGTCCAACCTGGTGCAGTCAGGGGCTGAAGTGAAAAAACC
TGGGGCCTCAGTGAAGGTGTCCTGCAAGGCTTCTGGCTACA
CCGCTACTAGGTACACGATGCACTGGGTAAGGCAGGCACCT
GGACAGGGTCTGGAATGGATTGGATACATTAATCCTAGCCG
TGGTTATACTAATTACGCACAGAAGTTGCAGGGGCCGCGTCA
CAATGACTACAGACACTTCCACCAGCACAGCCTACATGGAA
CTGAGCAGCCTGCGTTCTGAGGACACTGCAACCTATTACTG
TGCAAGATATTATGATGATCATTACTGCCTTGACTACTGGG
GCCAAGGCACCACGGTCACCGTCTCCTCAGGCGAAGGTACT
AGTACTGGTTCTGGTGGAAAGTGGAGGTTTCAGGTGGAGCAGA
CGACATTCAGATGACCCAGTCTCCATCTAGCCTGTCTGCAT
CTGTCGGGGACCGTGTCACCATCACCTGCAGAGCCAGTCAA
AGTGTAAGTTACATGAACTGGTACCAGCAGAAGCCGGGCAA
GGCACCCAAAAGATGGATTTATGACACATCCAAAGTGGCTT
CTGGAGTCCCTGCTCGCTTCAGTGGCAGTGGGTCTGGGACC
GACTACTCTCTCACAATCAACAGCTTGGAGGCTGAAGATGC
TGCCACTTATTACTGCCAACAGTGGAGTAGTAACCCGCTCA
CGTTCGGTGGCGGGACCAAGGTGGAGATCAAA

B) anti-CD3 (VH2/VL1)

DVQLVQSGAEVKKPGASVKVSCKASGYTATRYTMHWVRQAP
GQGLEWIGYINPSRGYTNYAQKLQGRVTMTTDTSTSTAYME
LSSLRSEDATYYCARYYDDHYCLDYWGQGTTVTVSSEGET
STGSGGSGGSGGADDIQMTQSPSSLSASVGDRTITCRASQ
SVSYMNWYQQKPGKAPKRWIYDTSKVASGVPARFSGSGSGT
DYSLTINSLEAEDAATYYCQQWSSNPLTFGGGTKVEIK

Figure 3**C) anti-CD3 (VH2/VL2)**

GACGTCCAACCTGGTGCAGTCAGGGGCTGAAGTGAAAA-
AACCTGGGGCCTCAGTGAAGGTGTCCTG-
CAAGGCTTCTGGCTACACCGCTACTAGGTACACGATG-
CACTGGGTAAGGCAGGCACCTGGACAGGGTCTGGAATGGAT
TGGATACATTAATCCTAGCCGTGGTTATACTAATTACGCA-
CAGAAGTTGCAGGGCCGCGTCACAATGACTACAGA-
CACTTCCACCAGCACAGCCTACATGGAAGTGAAG-
CAGCCTGCGTTCTGAGGACACTGCAACCTATTACTGTGCAA
GATATTATGATGATCATTACTGCCTTGACTACTGGGGC-
CAAGGCACCACGGTCACCGTCTCCTCAGGCGAAGGTAC-
TAGTACTGGTTCTGGTGGAAGTGGAGGTTTCAGGTGGAGCA-
GACGACATTGTACTGACCCAGTCTCCAGCAACTCTGTCTCT
GTCTCCAGGGGAGCGTGCCACCCTGAGCTGCAGAGCCAGT-
CAAAGTGTAAGTTACATGAACTGGTACCAGCA-
GAAGCCGGGCAAGGCACCCAAAAGATGGATTTATGACA-
CATCCAAAGTGGCTTCTGGAGTCCCTGCTCGCTTCAGTGGC
AGTGGGTCTGGGACCGACTACTCTCTCACAATCAA-
CAGCTTGGAGGCTGAAGATGCTGCCACTTATTACTGCCAA-
CAGTGGAGTAGTAACCCGCTCACGTTCCGGTGGCGGGAC-
CAAGGTGGAGATCAAA

D) anti-CD3 (VH2/VL2)

DVQLVQSGAEVKKPGASVKVSCKASGYTATRYTMHWVR-
QAPGQGLEWIGYINPSRGYTNV-
AQKLQGRVTMTTDTSTSTAYMELSSLRSEDATYYCA-
RYYDDHYCLDYWGQGTTVTVSSGEGTSTGSGGSGGSGGADD
IVLTQSPATLSLSPGERATLSCRASQSVSYMNWYQQKPG-
KAPKRWIYDTSKVASGVPARFSGSGSGTDYSLTINSLEAE-
DAATYYCQQWSSNPLTFGGGTKEIK

Figure 3**E) anti-CD3 (VH2/VL3)**

GACGTCCAACCTGGTGCAGTCAGGGGCTGAAGTGAAAA-
AACCTGGGGCCTCAGTGAAGGTGTCCTG-
CAAGGCTTCTGGCTACACCGCTACTAGGTACACGATG-
CACTGGGTAAGGCAGGCACCTGGACAGGGTCTGGAATGGAT
TGGATACATTAATCCTAGCCGTGGTTATACTAATTACGCA-
CAGAAGTTGCAGGGCCGCGTCACAATGACTACAGA-
CACTTCCACCAGCACAGCCTACATGGAAGTGAAG-
CAGCCTGCGTTCTGAGGACACTGCAACCTATTACTGTGCAA
GATATTATGATGATCATTACTGCCTTGACTACTGGGGC-
CAAGGCACCACGGTCACCGTCTCCTCAGGCGAAGGTAC-
TAGTACTGGTTCTGGTGGAAAGTGGAGGTTTCAGGTGGAGCA-
GACGACATTGTACTGACCCAGTCTCCAGCAACTCTGTCTCT
GTCTCCAGGGGAGCGTGCCACCCTGACCTGCAGAGC-
CAGTTCAAGTGTAAGTTACATGAACTGGTACCAGCA-
GAAGCCGGGCAAGGCACCCAAAAGATGGATTTATGACA-
CATCCAAAGTGGCTTCTGGAGTCCCTGCTCGCTTCAGTGGC
AGTGGGTCTGGGACCGACTACTCTCTCACAATCAA-
CAGCTTGGAGGCTGAAGATGCTGCCACTTATTACTGCCAA-
CAGTGGAGTAGTAACCCGCTCACGTTCCGGTGGCGGGAC-
CAAGGTGGAGATCAAA

F) anti-CD3 (VH2/VL3)

DVQLVQSGAEVKKPGASVKVSCKASGYTATRYTMHWVR-
QAPGQGLEWIGYINPSRGYTN-
AQKLQGRVTMTTDTSTSTAYMELSSLRSEDATYYCA-
RYYDDHYCLDYWGQGTTVTVSSGEGTSTGSGGSGGSGGADD
IVLTQSPATLSLSPGERATLTCRASSSVSYMNWYQQKPG-
KAPKRWIYDTSKVASGVPARFSGSGSGTDYSLTINSLEAE-
DAATYYCQQWSSNPLTFGGGTKVEIK

Figure 4**A) anti-CD3 (VH3/VL1)**

GACGTCCAAC TGGTGCAGTCAGGGGCTGAAGTGAAAAAACC
TGGGGCCTCAGTGAAGGTGTCCTGCAAGGCTTCTGGCTACA
CCGCTACTAGGTACACGATGCACTGGGTAAGGCAGGCACCT
GGACAGGGTCTGGAATGGATTGGATACATTAATCCTAGCCG
TGGTTATACTAATTACGCACAGAAGTTGCAGGGGCCGCGTCA
CAATGACTACAGACACTTCCACCAGCACAGCCTACCTGCAA
ATGAACAGCCTGAAAAC TGAAGGACACTGCAGTCTATTACTG
TGCAAGATATTATGATGATCATTACTGCCTTGACTACTGGG
GCCAAGGCACCACGGTCACCGTCTCCTCAGGCGAAGGTACT
AGTACTGGTTCTGGTGGAAAGTGGAGGTT CAGGTGGAGCAGA
CGACATTCAGATGACCCAGTCTCCATCTAGCCTGTCTGCAT
CTGTCGGGGACCGTGTCACCATCACCTGCAGAGCCAGTCAA
AGTGTAAGTTACATGAACTGGTACCAGCAGAAGCCGGGCAA
GGCACCCAAAAGATGGATTTATGACACATCCAAAGTGGCTT
CTGGAGTCCCTGCTCGCTTCAGTGGCAGTGGGTCTGGGACC
GACTACTCTCTCACAATCAACAGCTTGGAGGCTGAAGATGC
TGCCACTTATTACTGCCAACAGTGGAGTAGTAACCCGCTCA
CGTTCGGTGGCGGGACCAAGGTGGAGATCAAA

B) anti-CD3 (VH3/VL1)

DVQLVQSGAEVKKPGASVKVSCKASGYTATRYTMHWVR-
QAPGQGLEWIGYINPSRGYTN-
AQKLQGRVTMTTDTSTSTAYLQMNSLKTEDTAVYYCARYYDD-
HYCLDYWGQGTTVTVSSGEGTSTGSGGSGGSGGADDIQMTQSP
SSLSASVGRVTITCRASQSVSYMNWYQQKPG-
KAPKRWIYDTSKVASGVPARFSGSGSGTDYSLTINSLEAE-
DAATYYCQQWSSNPLTFGGGTKVEIK

Figure 4**C) anti-CD3 (VH3/VL2)**

GACGTCCAACCTGGTGCAGTCAGGGGCTGAAGTGAAAAAACC
TGGGGCCTCAGTGAAGGTGTCCTGCAAGGCTTCTGGCTACA
CCGCTACTAGGTACACGATGCACTGGGTAAGGCAGGCACCT
GGACAGGGTCTGGAATGGATTGGATACATTAATCCTAGCCG
TGGTTATACTAATTACGCACAGAAGTTGCAGGGGCCGCGTCA
CAATGACTACAGACACTTCCACCAGCACAGCCTACCTGCAA
ATGAACAGCCTGAAAACCTGAGGACACTGCAGTCTATTACTG
TGCAAGATATTATGATGATCATTACTGCCTTGACTACTGGG
GCCAAGGCACCACGGTCACCGTCTCCTCAGGCGAAGGTACT
AGTACTGGTTCTGGTGGAAAGTGGAGGTTTCAGGTGGAGCAGA
CGACATTGTACTGACCCAGTCTCCAGCAACTCTGTCTCTGT
CTCCAGGGGAGCGTGCCACCCTGAGCTGCAGAGCCAGTCAA
AGTGTAAGTTACATGAACCTGGTACCAGCAGAAGCCGGGCAA
GGCACC CAAAAGATGGATTTATGACACATCCAAAGTGGCTT
CTGGAGTCCCTGCTCGCTTCAGTGGCAGTGGGTCTGGGACC
GACTACTCTCTCACAATCAACAGCTTGGAGGCTGAAGATGC
TGCCACTTATTACTGCCAACAGTGGAGTAGTAACCCGCTCA
CGTTCGGTGGCGGGACCAAGGTGGAGATCAAA

D) anti-CD3 (VH3/VL2)

DVQLVQSGAEVKKPGASVKVSCKASGYTATRYTMHWVRQAP
GQGLEWIGYINPSRGYTNYAQKLQGRVTMTTDTSTSTAYLQ
MNSLKTEDTAVYYCARYYDDHYCLDYWGQGTTVTVSSGEGT
STGSGGSGGSGGADDIVLTQSPATLSLSPGERATLSCRASQ
SVSYMNWYQQKPGKAPKRWIYDTSKVASGVPARFSGSGSGT
DYSLTINSLEAEDAATYYCQQWSSNPLTFGGGTKVEIK

Figure 4**E) anti-CD3 (VH3/VL3)**

GACGTCCAAC TGGTGCAGTCAGGGGCTGAAGTGAAAA-
AACCTGGGGCCTCAGTGAAGGTGTCCTG-
CAAGGCTTCTGGCTACACCGCTACTAGGTACACGATG-
CACTGGGTAAGGCAGGCACCTGGACAGGGTCTGGAATGGAT
TGGATACATTAATCCTAGCCGTGGTTATACTAATTACGCA-
CAGAAGTTGCAGGGGCCGCGTCACAATGACTACAGA-
CACTTCCACCAGCACAGCCTACCTGCAAATGAACAGCCT-
GAAAAC TGGAGACACTGCAGTCTATTACTGTGCAAGATATT
ATGATGATCATTACTGCCTTGACTACTGGGGCCAAGGCAC-
CACGGTCACCGTCTCCTCAGGCGAAGGTACTAG-
TACTGGTTCTGGTGGAAAGTGGAGGTTCAGGTGGAGCAGAC-
GACATTGTACTGACCCAGTCTCCAGCAACTCTGTCTCTGTC
TCCAGGGGAGCGTGCCACCCTGACCTGCAGAGCCAGTT-
CAAGTGTAAGTTACATGAACTGGTACCAGCAGAAGCCGGG-
CAAGGCACCCAAAAGATGGATTTATGACACATCCA-
AAGTGGCTTCTGGAGTCCCTGCTCGCTTCAGTGGCAGTGGG
TCTGGGACCGACTACTCTCTCACAATCAACAGCTTG-
GAGGCTGAAGATGCTGCCACTTATTACTGCCAACAGTG-
GAGTAGTAACCCGCTCACGTTCCGGTGGCGGGACCAAGGTG-
GAGATCAAA

F) anti-CD3 (VH3/VL3)

DVQLVQSGAEVKKPGASVKVSCKASGYTATRYTMHWVR-
QAPGQGLEWIGYINPSRGYTN-
AQKLQGRVTMTTDTSTSTAYLQMNSLKTEDTAVYYCA-
RYYDDHYCLDYWGQGTTVTVSSGEGTSTGSGGSGGSGGADD
IVLTQSPATLSLSPGERATLTCRASSSVSYMNWYQQKPG-
KAPKRWIYDTSKVASGVPARFSGSGSGTDYSLTINSLEAE-
DAATYYCQQWSSNPLTFGGGTKVEIK

Figure 5**A) CD3 (VH5/VL1)**

GACGTCCAACCTGGTGCAGTCAGGGGCTGAAGTGAAAAAACC
TGGGGCCTCAGTGAAGGTGTCCTGCAAGGCTTCTGGCTACA
CCTTTACTAGGTACACGATGCACTGGGTAAAGGCAGGCACCT
GGACAGGGTCTGGAATGGATTGGATACATTAATCCTAGCCG
TGGTTATACTAATTACGCAGACAGCGTCAAGGGCCGCTTCA
CAATCACTACAGACAAATCCACCAGCACAGCCTACATGGAA
CTGAGCAGCCTGCGTTCTGAGGACACTGCAACCTATTACTG
TGCAAGATATTATGATGATCATTACTGCCTTGACTACTGGG
GCCAAGGCACCACGGTCACCGTCTCCTCAGGCGAAGGTACT
AGTACTGGTTCTGGTGGAAAGTGGAGGTTTCAGGTGGAGCAGA
CGACATTCAGATGACCCAGTCTCCATCTAGCCTGTCTGCAT
CTGTCGGGGACCGTGTCACCATCACCTGCAGAGCCAGTCAA
AGTGTAAGTTACATGAACTGGTACCAGCAGAAGCCGGGCAA
GGCACCCAAAAGATGGATTTATGACACATCCAAAGTGGCTT
CTGGAGTCCCTGCTCGCTTCAGTGGCAGTGGGTCTGGGACC
GACTACTCTCTCACAATCAACAGCTTGGAGGCTGAAGATGC
TGCCACTTATTACTGCCAACAGTGGAGTAGTAACCCGCTCA
CGTTCGGTGGCGGGACCAAGGTGGAGATCAAA

B) CD3 (VH5/VL1)

DVQLVQSGAEVKKPGASVKVSCKASGYTFTRYTMHWVRQAP
GQGLEWIGYINPSRGYTNADSVKGRFTITTDKSTSTAYME
LSSLRSEDATYYCARYYDDHYCLDYWGQGTTVTVSSGEGT
STGSGGSGGSGGADDIQMTQSPSSLSASVGDRVITICRASQ
SVSYMNWYQQKPGKAPKRWIYDTSKVASGVPARFSGSGSGT
DYSLTINSLEAEDAATYYCQQWSSNPLTFGGGTKVEIK

Figure 5**C) anti-CD3 (VH5/VL2)**

GACGTCCAACTGGTGCAGTCAGGGGCTGAAGTGAAAAAACC
TGGGGCCTCAGTGAAGGTGTCCTGCAAGGCTTCTGGCTACA
CCTTTACTAGGTACACGATGCACTGGGTAAGGCAGGCACCT
GGACAGGGTCTGGAATGGATTGGATACATTAATCCTAGCCG
TGGTTATACTAATTACGCAGACAGCGTCAAGGGCCGCTTCA
CAATCACTACAGACAAATCCACCAGCACAGCCTACATGGAA
CTGAGCAGCCTGCGTTCTGAGGACACTGCAACCTATTACTG
TGCAAGATATTATGATGATCATTACTGCCTTGACTACTGGG
GCCAAGGCACCACGGTCACCGTCTCCTCAGGCGAAGGTACT
AGTACTGGTTCTGGTGGAAAGTGGAGGTTTCAGGTGGAGCAGA
CGACATTGTACTGACCCAGTCTCCAGCAACTCTGTCTCTGT
CTCCAGGGGAGCGTGCCACCCTGAGCTGCAGAGCCAGTCAA
AGTGTAAGTTACATGAACTGGTACCAGCAGAAGCCGGGCAA
GGCACCCAAAAGATGGATTTATGACACATCCAAAGTGGCTT
CTGGAGTCCCTGCTCGCTTCAGTGGCAGTGGGTCTGGGACC
GACTACTCTCTCACAATCAACAGCTTGGAGGCTGAAGATGC
TGCCACTTATTACTGCCAACAGTGGAGTAGTAACCCGCTCA
CGTTCGGTGGCGGGACCAAGGTGGAGATCAAA

D) anti-CD3 (VH5/VL2)

DVQLVQSGAEVKKPGASVKVSCKASGYTFTRYTMHWVRQAP
GQGLEWIGYINPSRGYTNYSVKGRTITTDKSTSTAYME
LSSLRSEDATYYCARYYDDHYCLDYWGQGTTVTVSSGEGT
STGSGSGSGSGGADDIVLTQSPATLSLSPGERATLSCRASQ
SVSYMNWYQQKPGKAPKRWIYDTSKVASGVPARFSGSGSGT
DYSLTINSLEAEDAATYYCQQWSSNPLTFGGGTKVEIK

Figure 5**E) anti-CD3 (VH5/VL3)**

GACGTCCAACCTGGTGCAGTCAGGGGCTGAAGTGAAAA-
AACCTGGGGCCTCAGTGAAGGTGTCCTG-
CAAGGCTTCTGGCTACACCTTTACTAGGTACACGATG-
CACTGGGTAAGGCAGGCACCTGGACAGGGTCTGGAATGGAT
TGGATACATTAATCCTAGCCGTGGTTATACTAATTACG-
CAGACAGCGTCAAGGGCCGCTTCACAATCACTACAGACA-
AATCCACCAGCACAGCCTACATGGAAGTGAAG-
CAGCCTGCGTTCTGAGGACACTGCAACCTATTACTGTGCAA
GATATTATGATGATCATTACTGCCTTGACTACTGGGGC-
CAAGGCACCACGGTCACCGTCTCCTCAGGCGAAGGTAC-
TAGTACTGGTTCTGGTGGAAAGTGGAGGTTTCAGGTGGAG-
CAGACGACATTGTACTGACCCAGTCTCCAGCAACTCTGTCT
CTGTCTCCAGGGGAGCGTGCCACCCTGACCTGCAGAGC-
CAGTTCAAGTGTAAGTTACATGAACTGGTACCAGCA-
GAAGCCGGGCAAGGCACCCAAAAGATGGATTTATGACA-
CATCCAAAGTGGCTTCTGGAGTCCCTGCTCGCTTCAGTGGC
AGTGGGTCTGGGACCGACTACTCTCTCACAATCAA-
CAGCTTGGAGGCTGAAGATGCTGCCACTTATTACTGC-
CAACAGTGGAGTAGTAACCCGCTCACGTTCCGGTGGCGG-
GACCAAGGTGGAGATCAAA

F) anti-CD3 (VH5/VL3)

DVQLVQSGAEVKKPGASVKVSCKASGYTFTRYTMHWVR-
QAPGGGLEWIGYINPSRGYTN-
ADSVKGRFTITTDKSTSTAYMELSSLRSEDATATYYCA-
RYYDDHYCLDYWGQGTIVTVSSGEGTSTGSGGSGGSGGADD
IVLTQSPATLSLSPGERATLTCRASSSVSYMNWYQQKPG-
KAPKRWIYDTSKVASGVPARFSGSGSGTDYSLTINSLEAE-
DAATYYCQQWSSNPLTFGGGKVEIK

Figure 6**A) anti-CD3 (VH7/VL1)**

GACGTCCAACCTGGTGCAGTCAGGGGCTGAAGTGAAAAAACC
TGGGGCCTCAGTGAAGGTGTCCTGCAAGGCTTCTGGCTACA
CCTTTACTAGGTACACGATGCACTGGGTAAGGCAGGCACCT
GGACAGGGTCTGGAATGGATTGGATACATTAATCCTAGCCG
TGGTTATACTAATTACAATCAGAAGTTCAAGGACCGCGTCA
CAATCACTACAGACAAATCCACCAGCACAGCCTACATGGAA
CTGAGCAGCCTGCGTTCTGAGGACACTGCAGTCTATTACTG
TGCAAGATATTATGATGATCATTACTGCCTTGACTACTGGG
GCCAAGGCACCACGGTCACCGTCTCCTCAGGCGAAGGTACT
AGTACTGGTTCTGGTGGAAAGTGGAGGTTTCAGGTGGAGCAGA
CGACATTCAGATGACCCAGTCTCCATCTAGCCTGTCTGCAT
CTGTCGGGGACCGTGTCACCATCACCTGCAGAGCCAGTCAA
AGTGTAAGTTACATGAACTGGTACCAGCAGAAGCCGGGCAA
GGCACCCAAAAGATGGATTTATGACACATCCAAAGTGGCTT
CTGGAGTCCCTGCTCGCTTCAGTGGCAGTGGGTCTGGGACC
GACTACTCTCTCACAATCAACAGCTTGGAGGCTGAAGATGC
TGCCACTTATTACTGCCAACAGTGGAGTAGTAACCCGCTCA
CGTTCGGTGGCGGGACCAAGGTGGAGATCAAA

B) anti-CD3 (VH7/VL1)

DVQLVQSGAEVKKPGASVKVSCKASGYTFTRYTMHWVR-
QAPGQGLEWIGYINPSRGYT-
NYNQKFKDRVITITDKSTSTAYMELSSLRSED TAVYYCA-
RYYDDHYCLDYWGQGTTVTVSSGEGTSTGSGGSGGSGGADD
IQMTQSPSSLSASVGDRVITICRASQSVSYMNWYQQKPG-
KAPKRWIYDTSKVASGVPARFSGSGSGTDYSLTINSLEAE-
DAATYYCQQWSSNPLTFGGG TKVEIK

Figure 6**C) anti-CD3 (VH7/VL2)**

GACGTCCAACCTGGTGCAGTCAGGGGCTGAAGTGAAAAAACC
TGGGGCCTCAGTGAAGGTGTCCTGCAAGGCTTCTGGCTACA
CCTTTACTAGGTACACGATGCACTGGGTAAAGGCAGGCACCT
GGACAGGGTCTGGAATGGATTGGATACATTAATCCTAGCCG
TGGTTATACTAATTACAATCAGAAGTTCAAGGACCGCGTCA
CAATCACTACAGACAAATCCACCAGCACAGCCTACATGGAA
CTGAGCAGCCTGCGTTCTGAGGACACTGCAGTCTATTACTG
TGCAAGATATTATGATGATCATTACTGCCTTGACTACTGGG
GCCAAGGCACCACGGTCACCGTCTCCTCAGGCGAAGGTACT
AGTACTGGTTCTGGTGGAAAGTGGAGGTTCAAGGTGGAGCAGA
CGACATTGTACTGACCCAGTCTCCAGCAACTCTGTCTCTGT
CTCCAGGGGAGCGTGCCACCCTGAGCTGCAGAGCCAGTCAA
AGTGTAAGTTACATGAACTGGTACCAGCAGAAGCCGGGCAA
GGCACCCAAAAGATGGATTTATGACACATCCAAAGTGGCTT
CTGGAGTCCCTGCTCGCTTCAGTGGCAGTGGGTCTGGGACC
GACTACTCTCTCACAATCAACAGCTTGGAGGCTGAAGATGC
TGCCACTTATTACTGCCAACAGTGGAGTAGTAACCCGCTCA
CGTTCGGTGGCGGGACCAAGGTGGAGATCAAA

D) anti-CD3 (VH7/VL2)

DVQLVQSGAEVKKPGASVKVSCKASGYTFTRYTMHWVR-
QAPGQGLEWIGYINPSRGYT-
NYNQKFKDRVITTDKSTSTAYMELSSLRSED TAVYYCA-
RYYDDHYCLDYWGQGTTVTVSSGEGTSTGSGGSGGSGGADD
IVLTQSPATLSLSPGERATLSCRASQSVSYMNWYQQKPG-
KAPKRWIYDTSKVASGVPARFSGSGSGTDYSLTINSLEAE-
DAATYYCQQWSSNPLTFGGGTKEIK

Figure 6**E) anti-CD3 (VH7/VL3)**

GACGTCCAACCTGGTGCAGTCAGGGGCTGAAGTGAAAA-
AACCTGGGGCCTCAGTGAAGGTGTCCTG-
CAAGGCTTCTGGCTACACCTTTACTAGGTACACGATG-
CACTGGGTAAGGCAGGCACCTGGACAGGGTCTGGAATGGAT
TGGATACATTAATCCTAGCCGTGGTTATACTAATTACAAT-
CAGAAGTTCAAGGACCGCGTCACAATCACTACAGACA-
AATCCACCAGCACAGCCTACATGGAAGTGAAG-
CAGCCTGCGTTCTGAGGACACTGCAGTCTATTACTGTGCAA
GATATTATGATGATCATTACTGCCTTGACTACTGGGGC-
CAAGGCACCACGGTCACCGTCTCCTCAGGCGAAGGTAC-
TAGTACTGGTTCTGGTGGAAAGTGGAGGTTTCAGGTGGAGCA-
GACGACATTGTACTGACCCAGTCTCCAGCAACTCTGTCTCT
GTCTCCAGGGGAGCGTGCCACCCTGACCTGCAGAGC-
CAGTTCAAGTGTAAGTTACATGAACTGGTACCAGCA-
GAAGCCGGGCAAGGCACCCAAAAGATGGATTTATGACA-
CATCCAAAGTGGCTTCTGGAGTCCCTGCTCGCTTCAGTGGC
AGTGGGTCTGGGACCGACTACTCTCTCACAATCAA-
CAGCTTGGAGGCTGAAGATGCTGCCACTTATTACTGCCAA-
CAGTGGAGTAGTAACCCGCTCACGTTCCGGTGGCGGGAC-
CAAGGTGGAGATCAAA

F) anti-CD3 (VH7/VL3)

DVQLVQSGAEVKKPGASVKVSCKASGYTFTRYTMHWVR-
QAPGQGLEWIGYINPSRGYT-
NYNQKFKDRVITITDKSTSTAYMELSSLRSEDVAVYYCA-
RYYDDHYCLDYWGQGTTVTVSSGEGTSTGSGGSGGSGGADD
IVLTQSPATLSLSPGERATLTCRASSSVSYMNWYQQKPG-
KAPKRWIYDTSKVASGVPARFSGSGSGTDYSLTINSLEAE-
DAATYYCQQWSSNPLTFGGGTKVEIK

Figure 7A

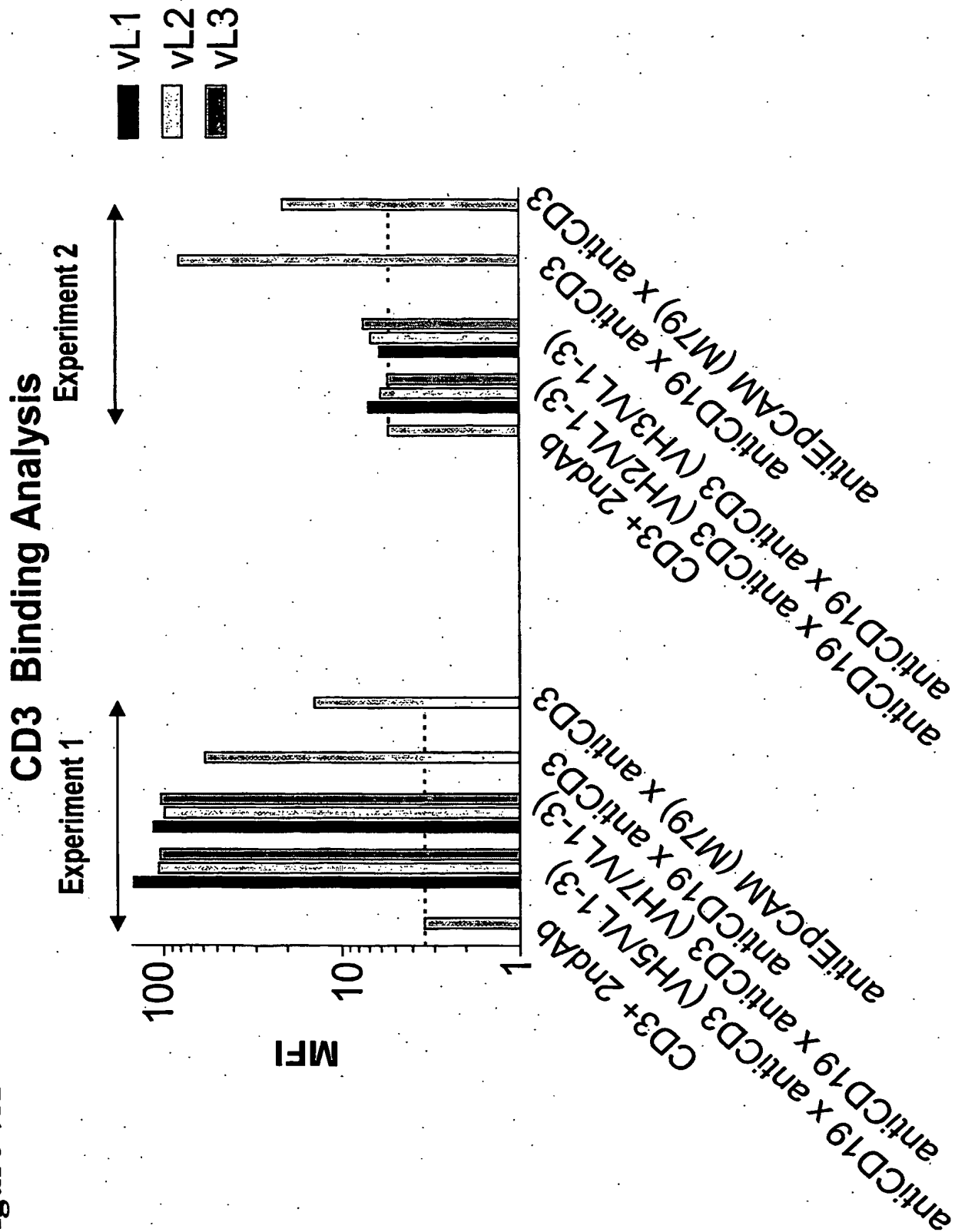


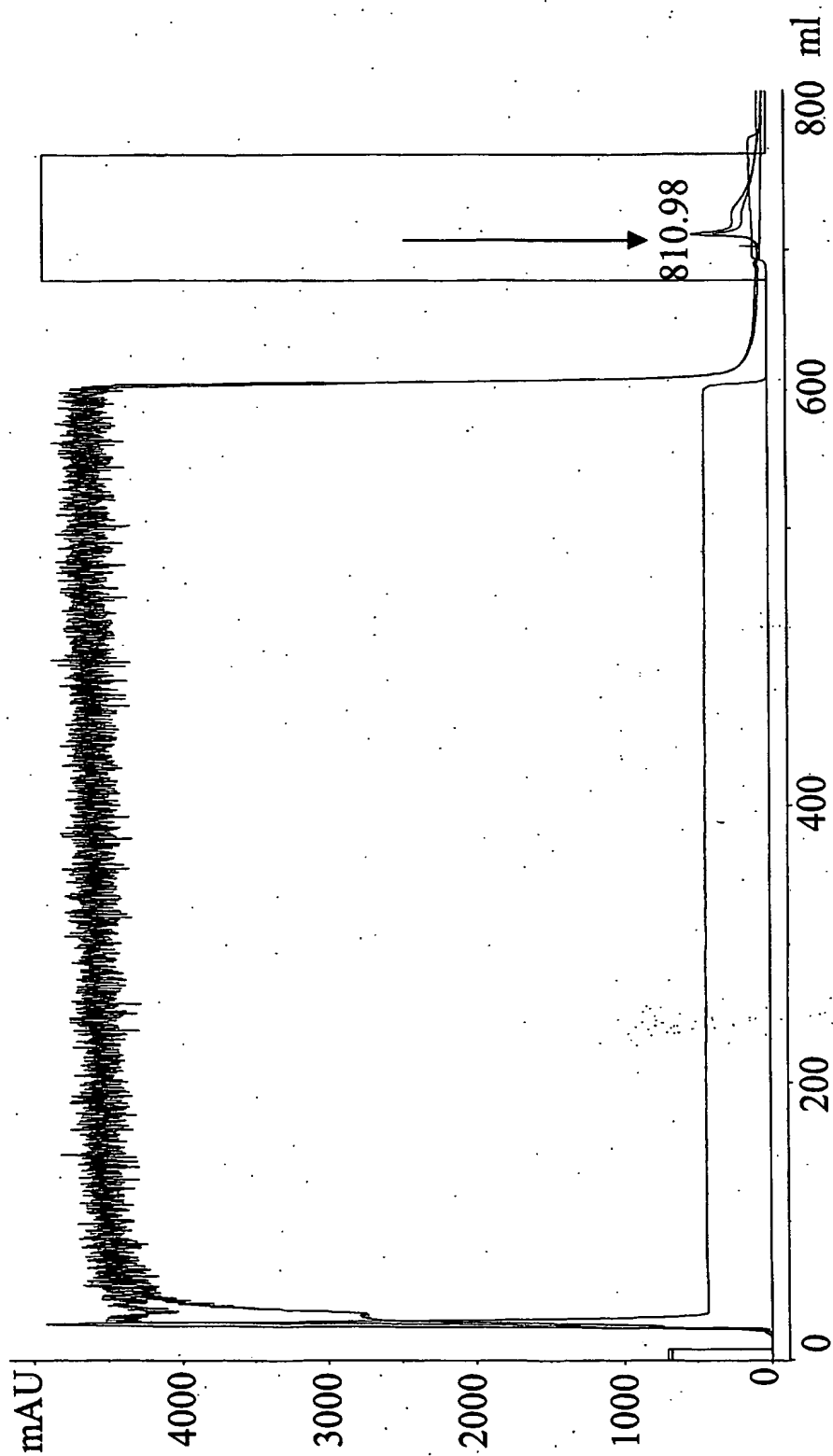
Figure 8

Figure 9

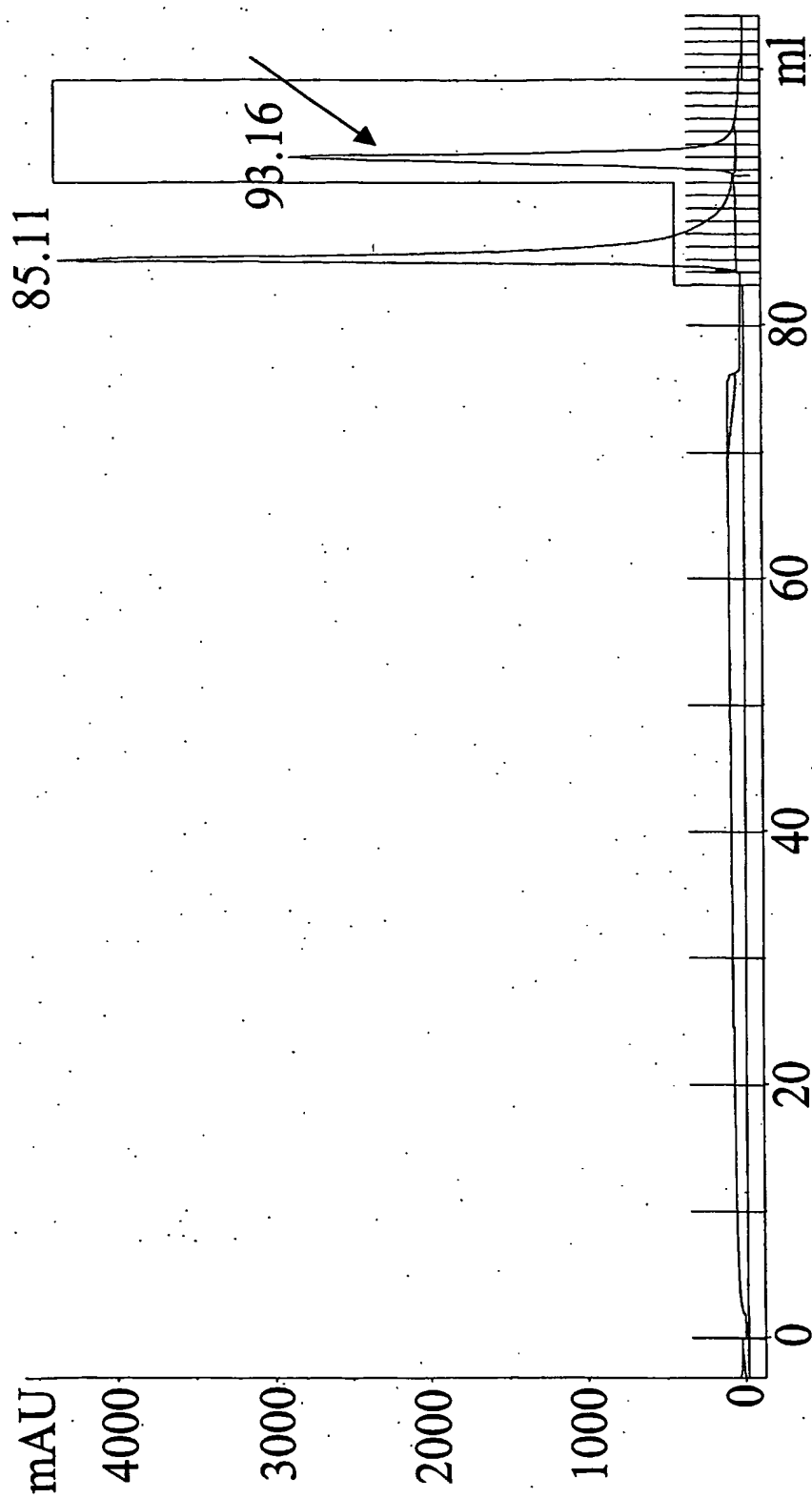


Figure 10

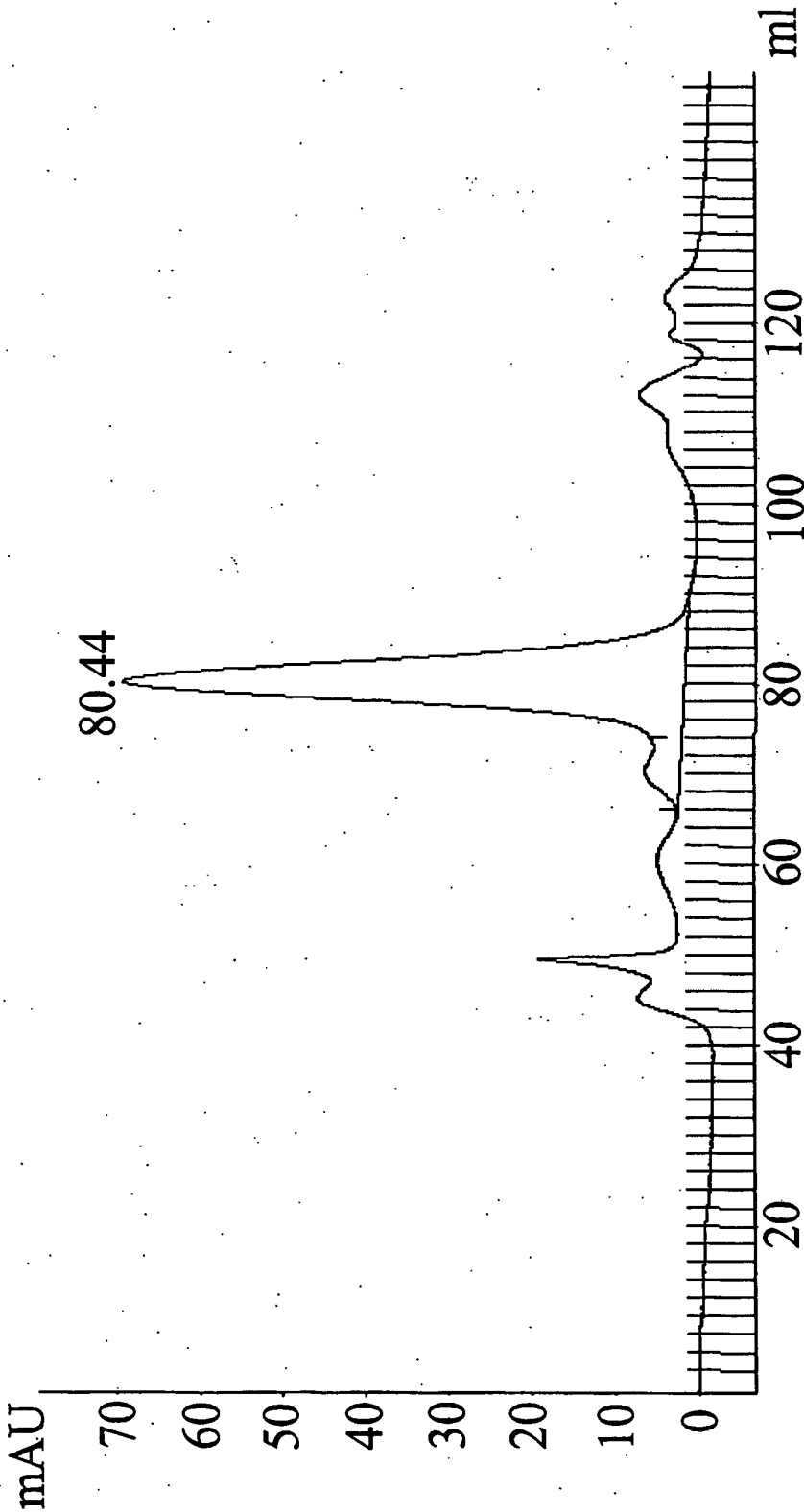


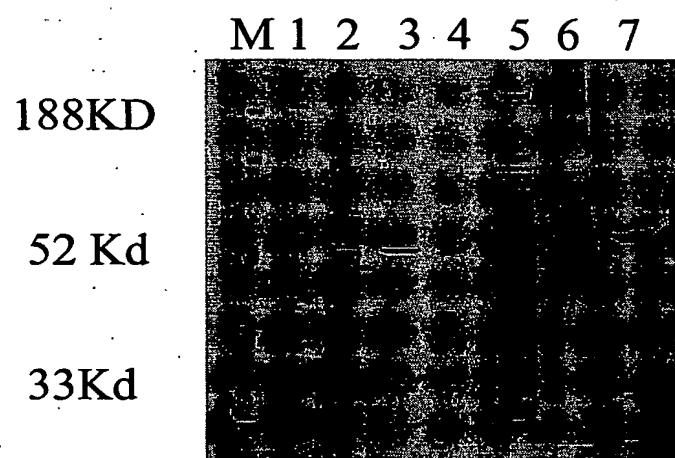
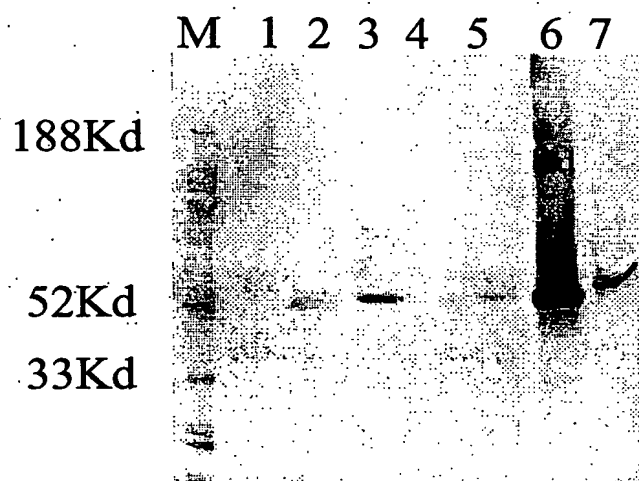
Figure 11**A)****B)**

Figure 12A

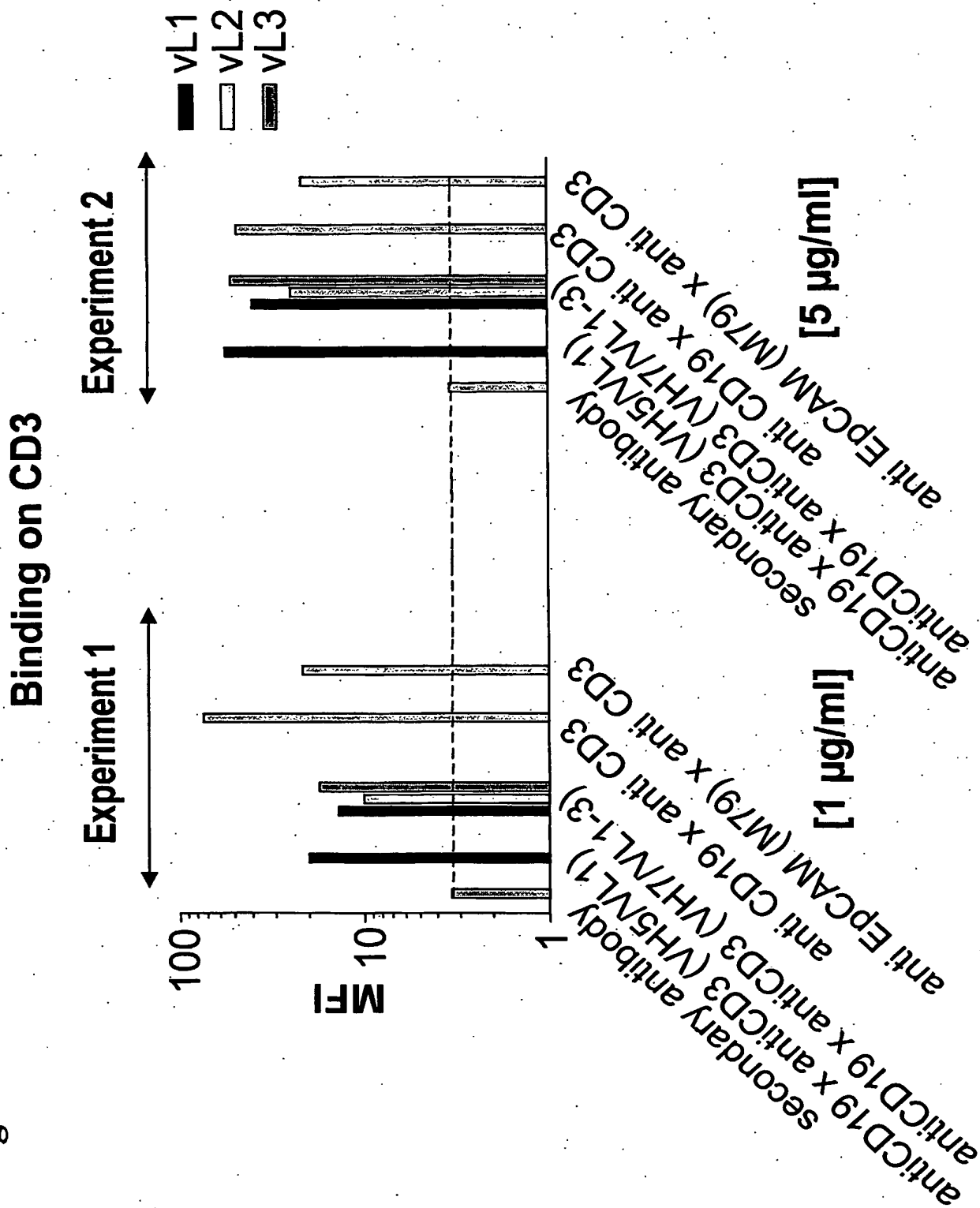


Figure 12B

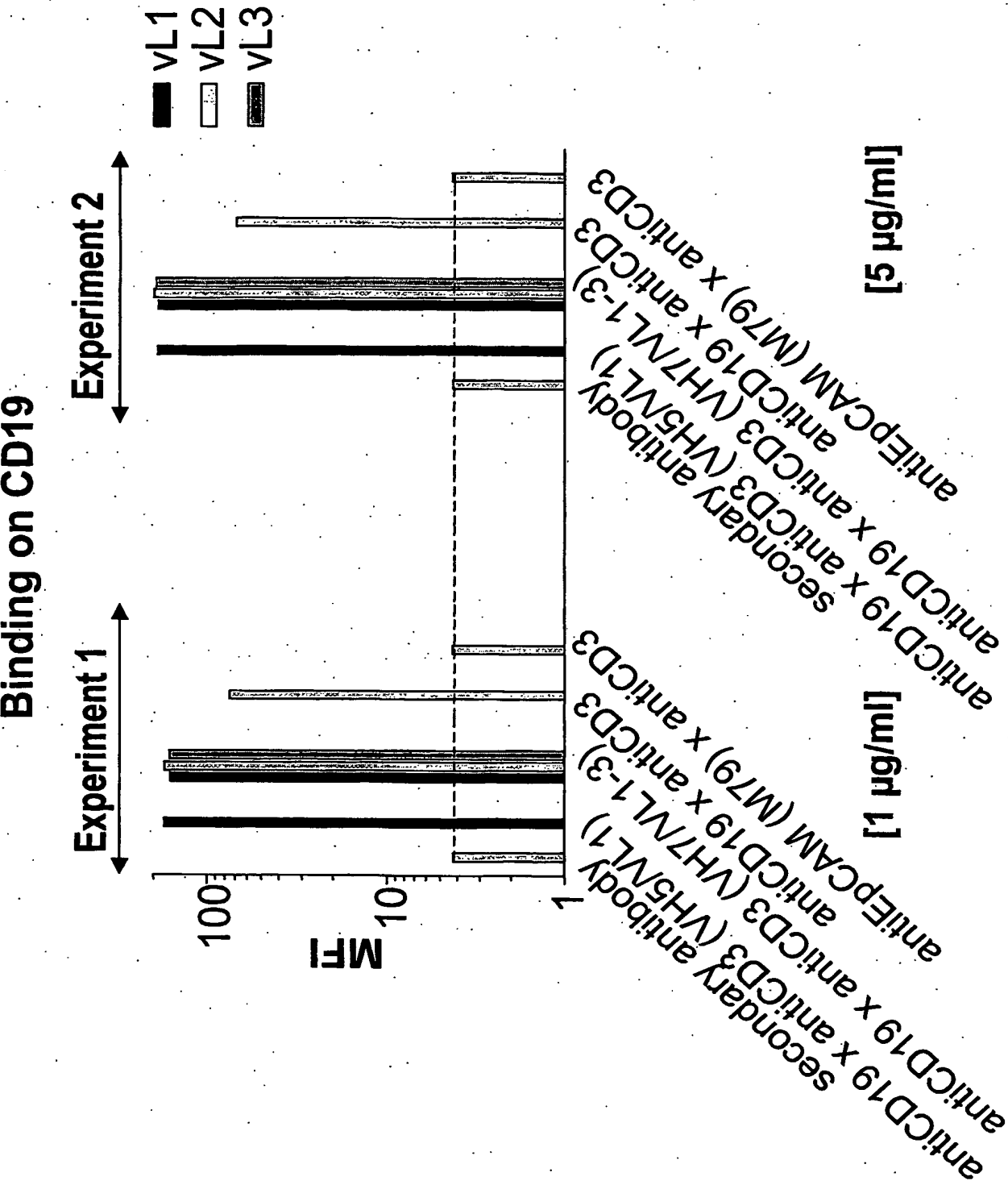


Figure 13

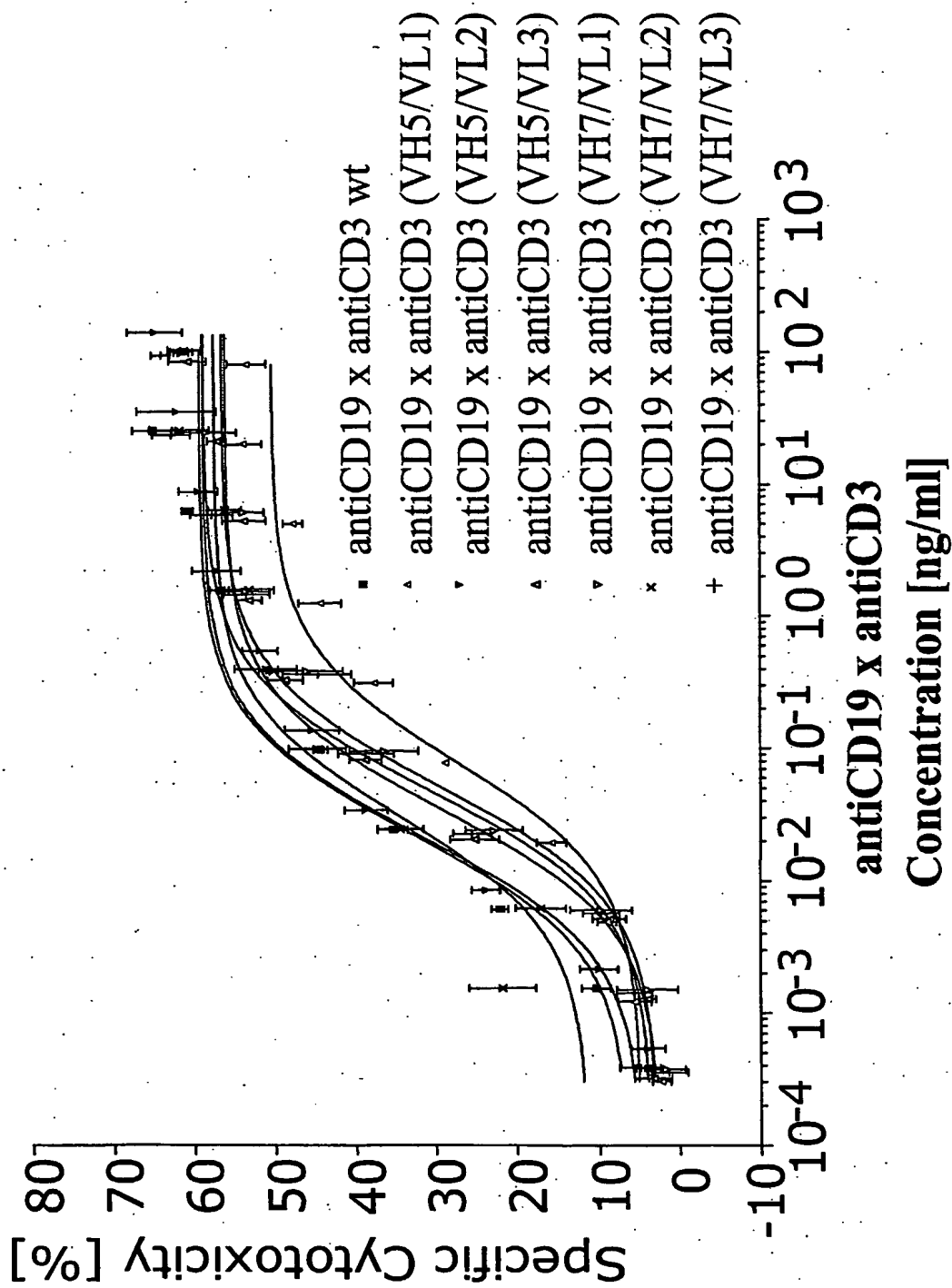


Figure 14

	FR1	CDR1	FR2	CDR2
nondeimmunized				
anti-CD3	DIKLQSGAELARPGASVKMSCKTS	GYTFTRYTMHWVKQRPQGQLEWIGYINPSRGYTNYNQKFKD		
anti-CD3 VH5	DVQLVQSGAEVKKPGASVKVSKKASGYTF	TRYTMHWVVRQAPGQGLEWIGYINPSRGYTNYADSVKG		
anti-CD3 VH7	DVQLVQSGAEVKKPGASVKVSKKASGYTF	TRYTMHWVVRQAPGQGLEWIGYINPSRGYTNYNQKFKD		
anti-CD3 VH2	DVQLVQSGAEVKKPGASVKVSKKASGYTAT	TRYTMHWVVRQAPGQGLEWIGYINPSRGYTNYAQKLQG		
anti-CD3 VH3	DVQLVQSGAEVKKPGASVKVSKKASGYTAT	TRYTMHWVVRQAPGQGLEWIGYINPSRGYTNYAQKLQG		
anti-CD3				
anti-CD3 VH5				
anti-CD3 VH7				
anti-CD3 VH2				
anti-CD3 VH3				

	FR3	CDR3	FR4
nondeimmunized			
anti-CD3	KATLTIDKSSSTAYMQLSSLTSED	SAVYYCARYDDHYCLDYWGQGTTLTVSS	
anti-CD3 VH5	RFTITTDKSTSTAYMELSSLRSED	TATYCARYYDDHYCLDYWGQGTTLTVSS	
anti-CD3 VH7	RVTITTDKSTSTAYMELSSLRSED	TAVYYCARYDDHYCLDYWGQGTTLTVSS	
anti-CD3 VH2	RVTMTTDTSTSTAYMELSSLRSED	TATYCARYYDDHYCLDYWGQGTTLTVSS	
anti-CD3 VH3	RVTMTTDTSTSTAYLQMNSLKTED	TAVYYCARYDDHYCLDYWGQGTTLTVSS	

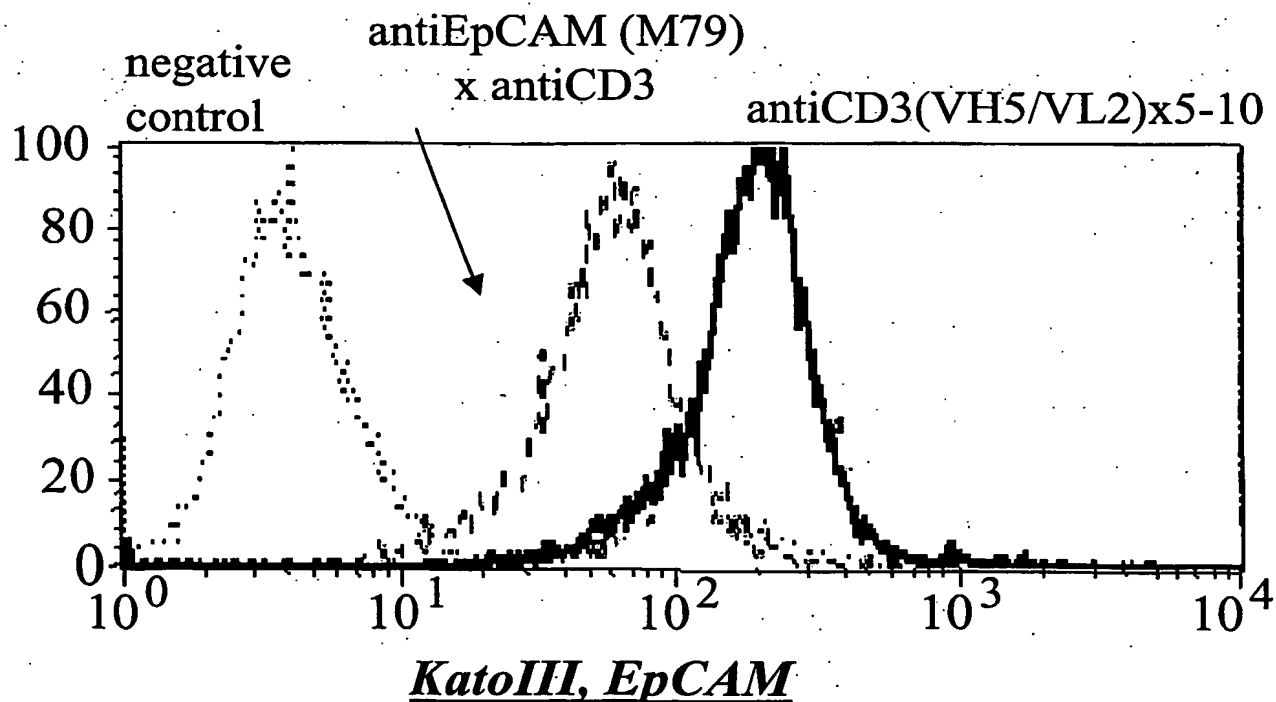
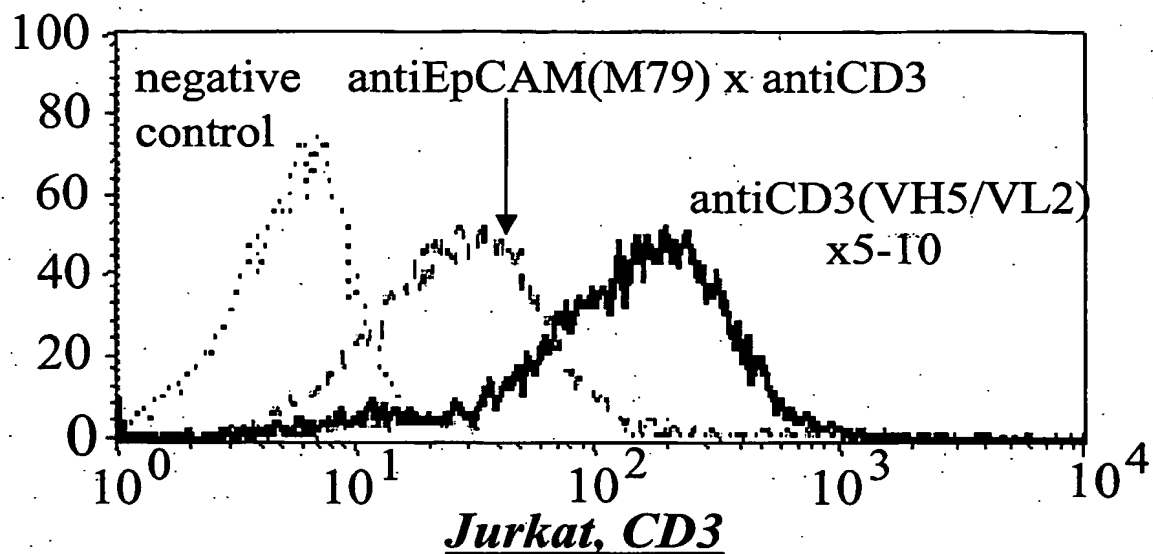
Figure 15 A**antiCD3(VH5/VL2) x 5-10 (SEQ ID NO: 37)**

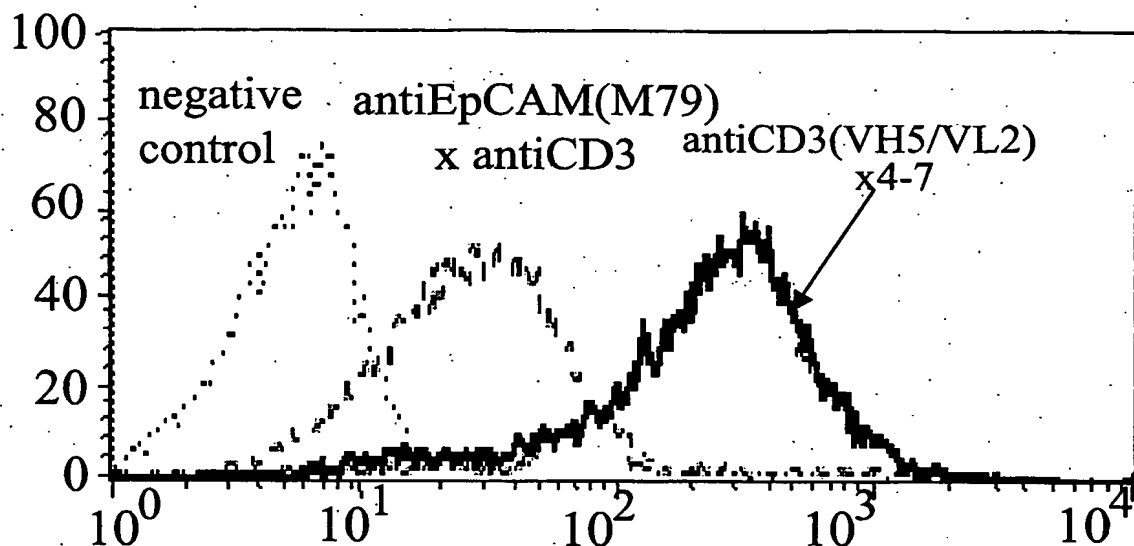
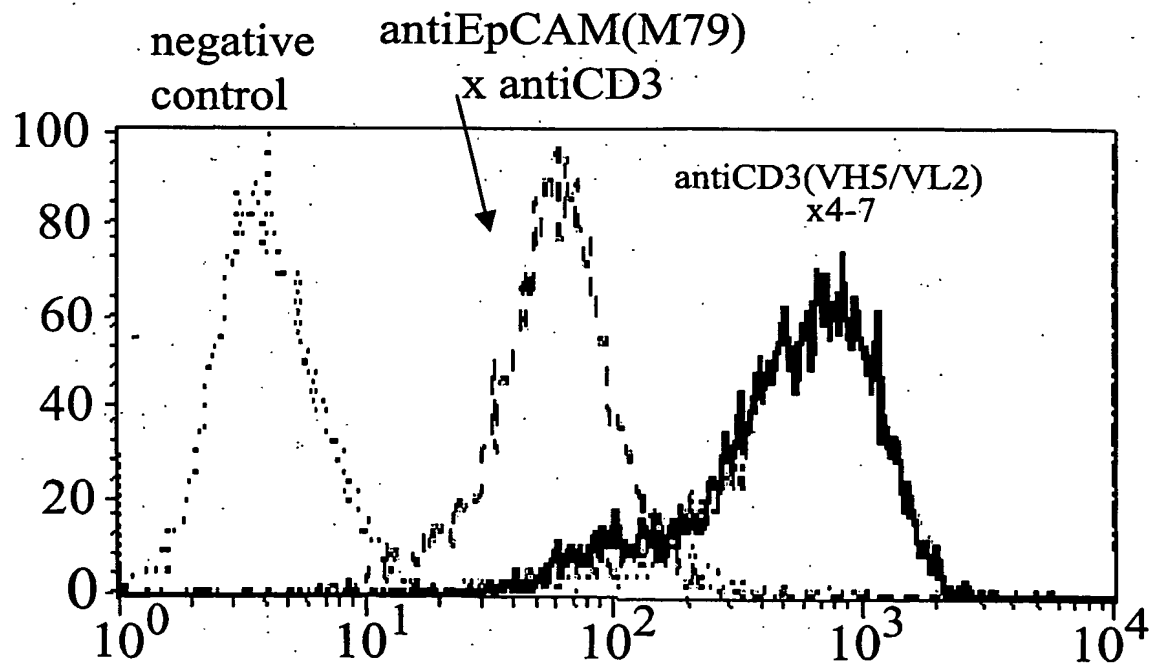
Figure 15B**antiCD3(VH5/VL2) x 4-7 (SEQ ID NO:33)****Jurkat, CD3****KatoIII, EpCAM**

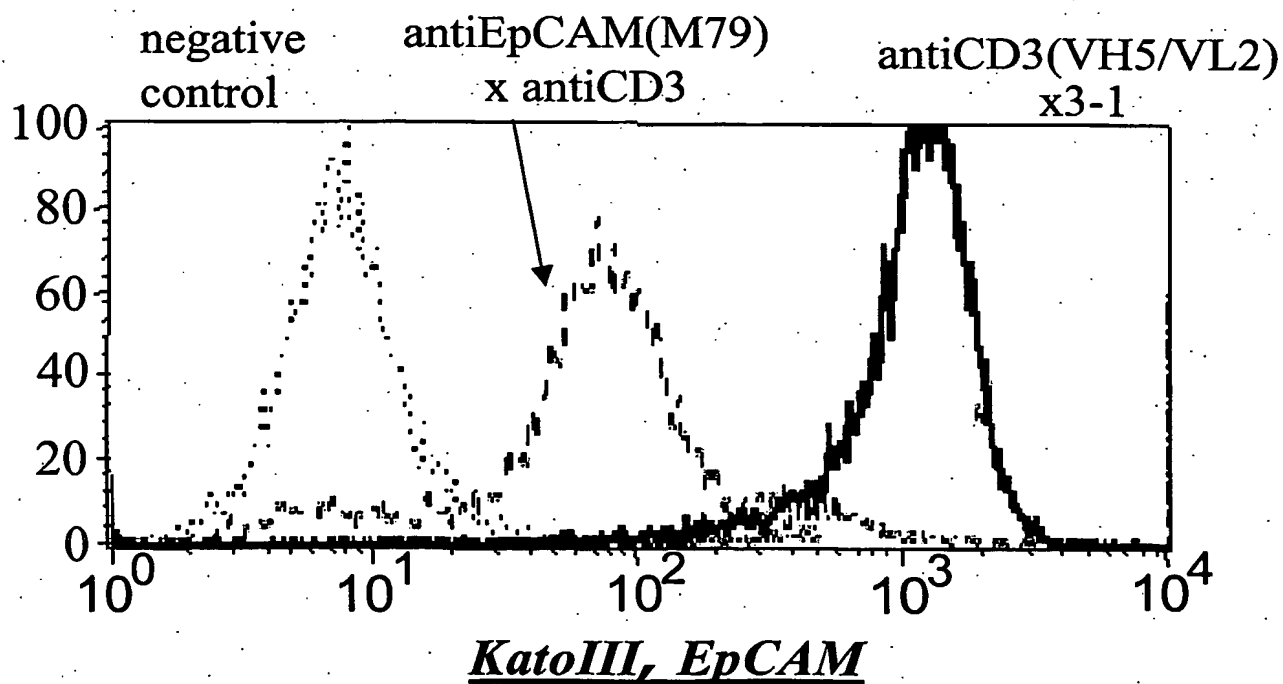
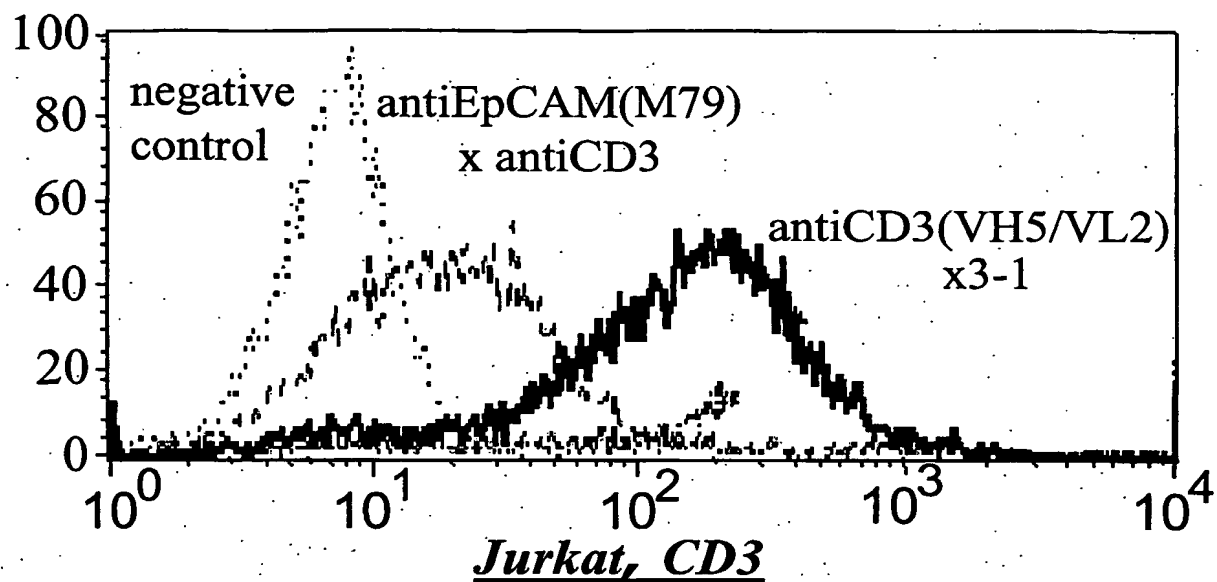
Figure 15C**antiCD3(VH5/VL2) x 3-1 (SEQ ID NO:31)**

Figure 15 D

**antiCD3(VH5/VL2) x 4-7 VL-VH
(SEQ ID NO: 35)**

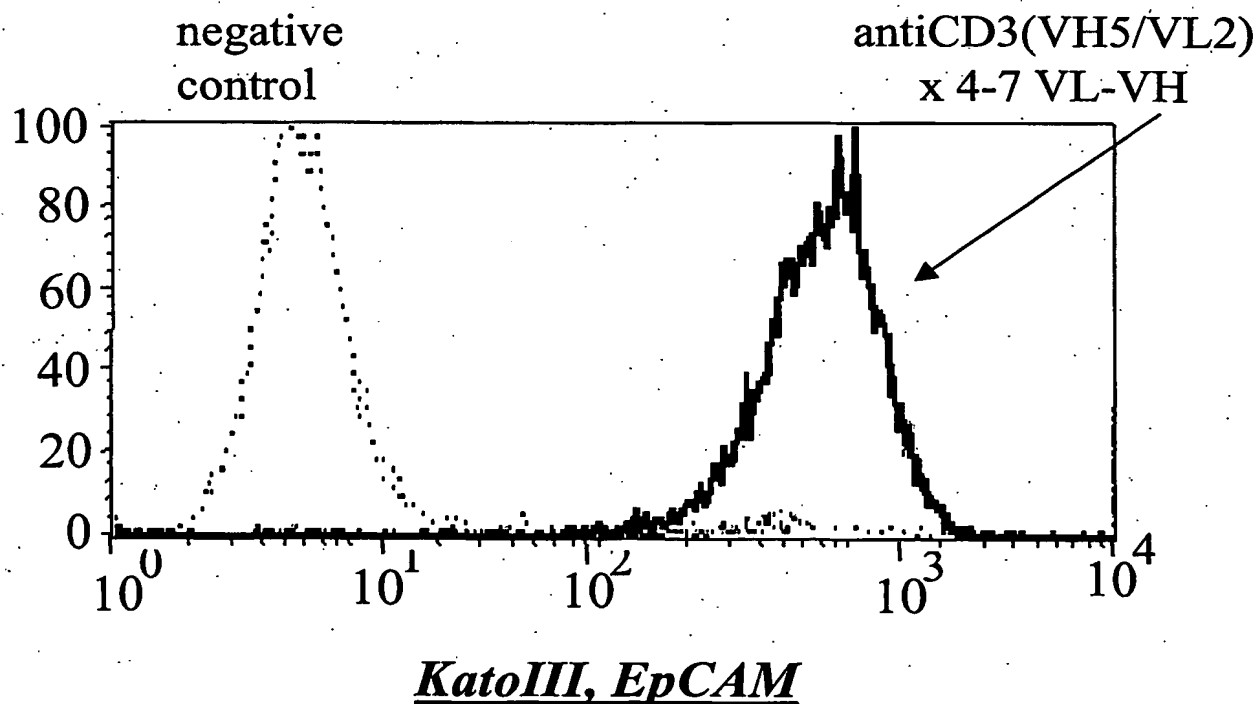
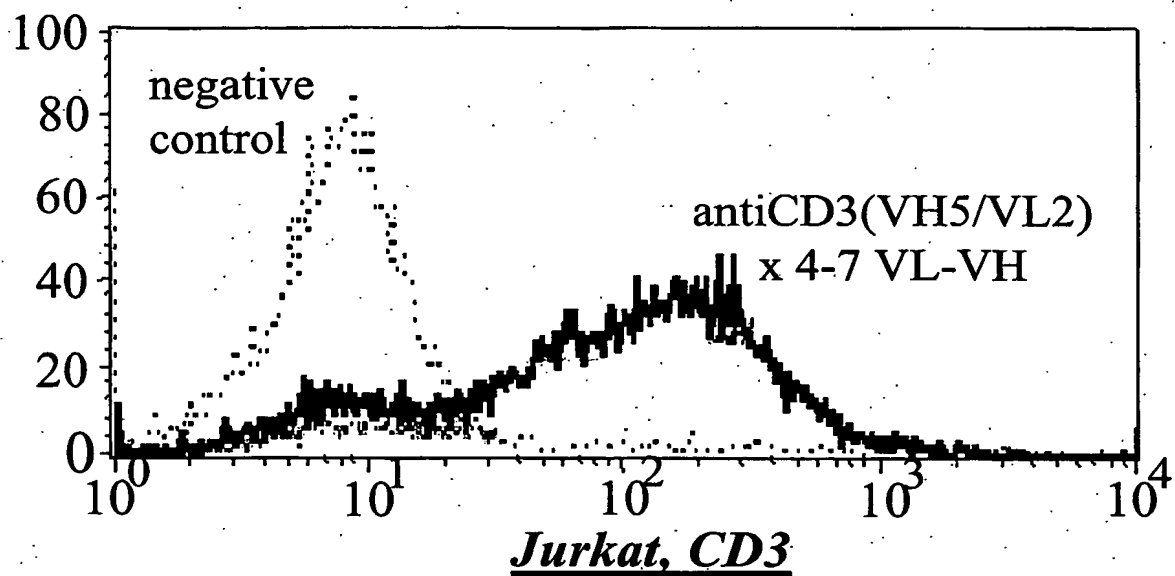


Figure 15 E

**antiCD3(VH5/VL2) x 5-10 VL-VH
(SEQ ID NO:39)**

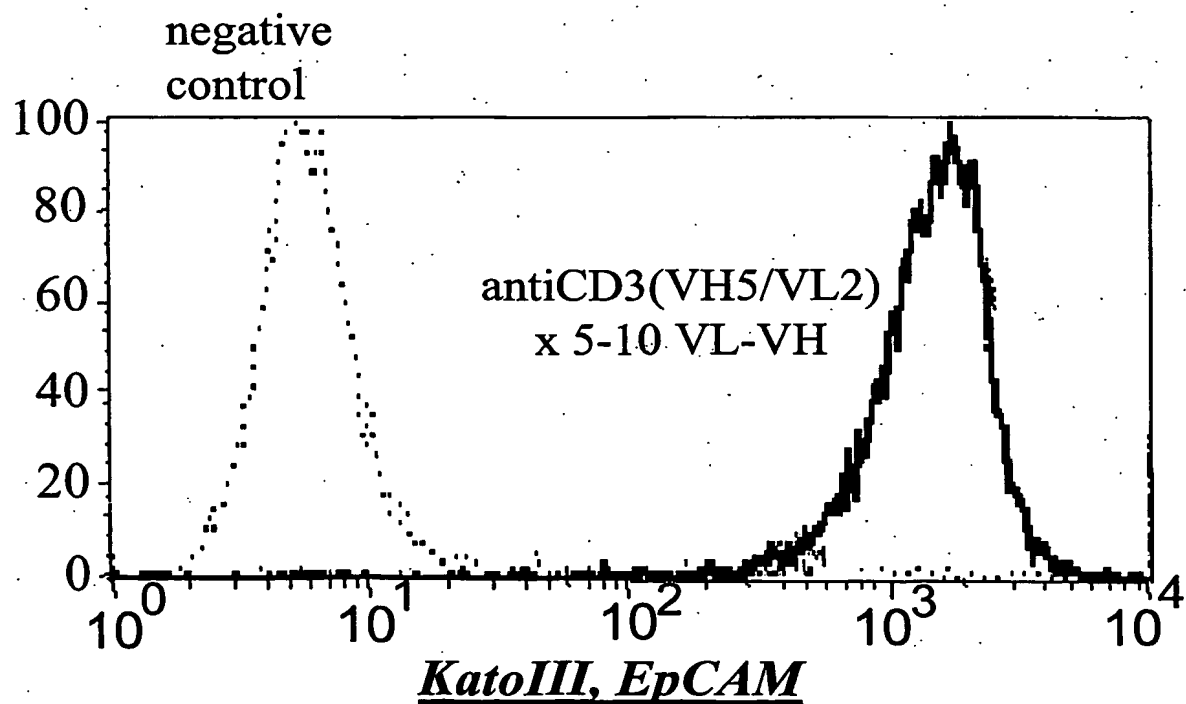
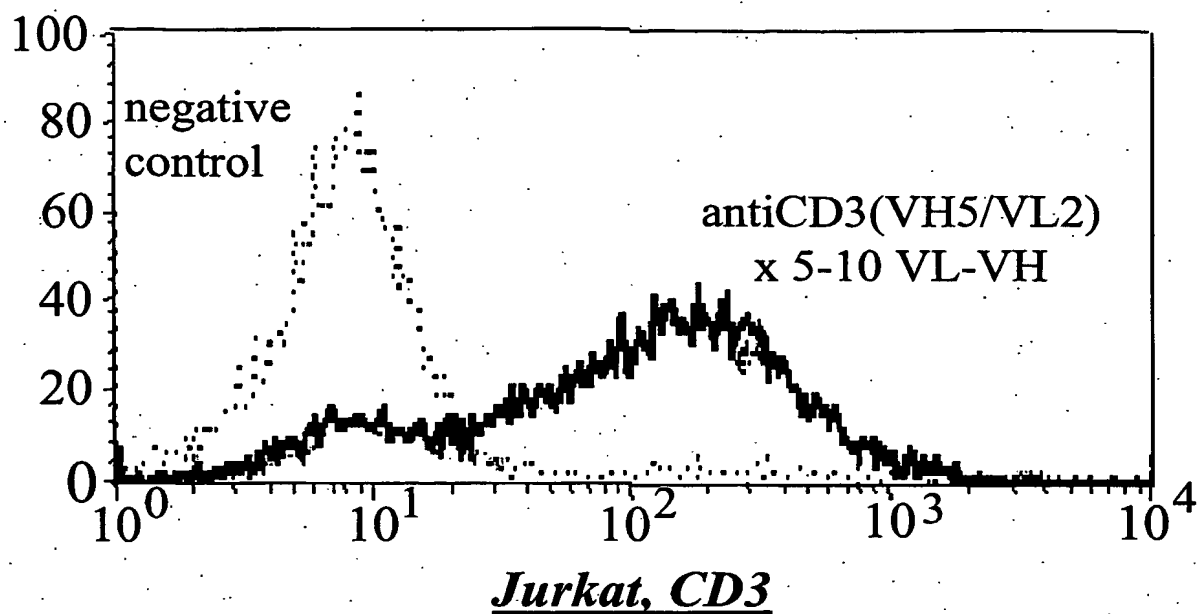
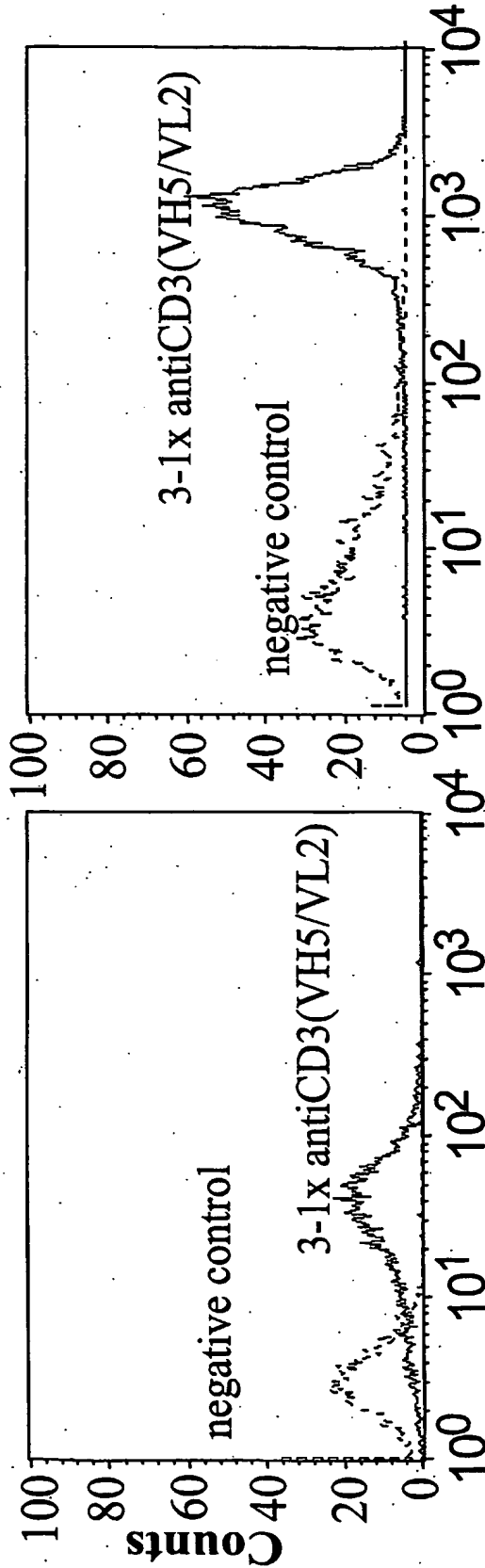


Figure 16 A

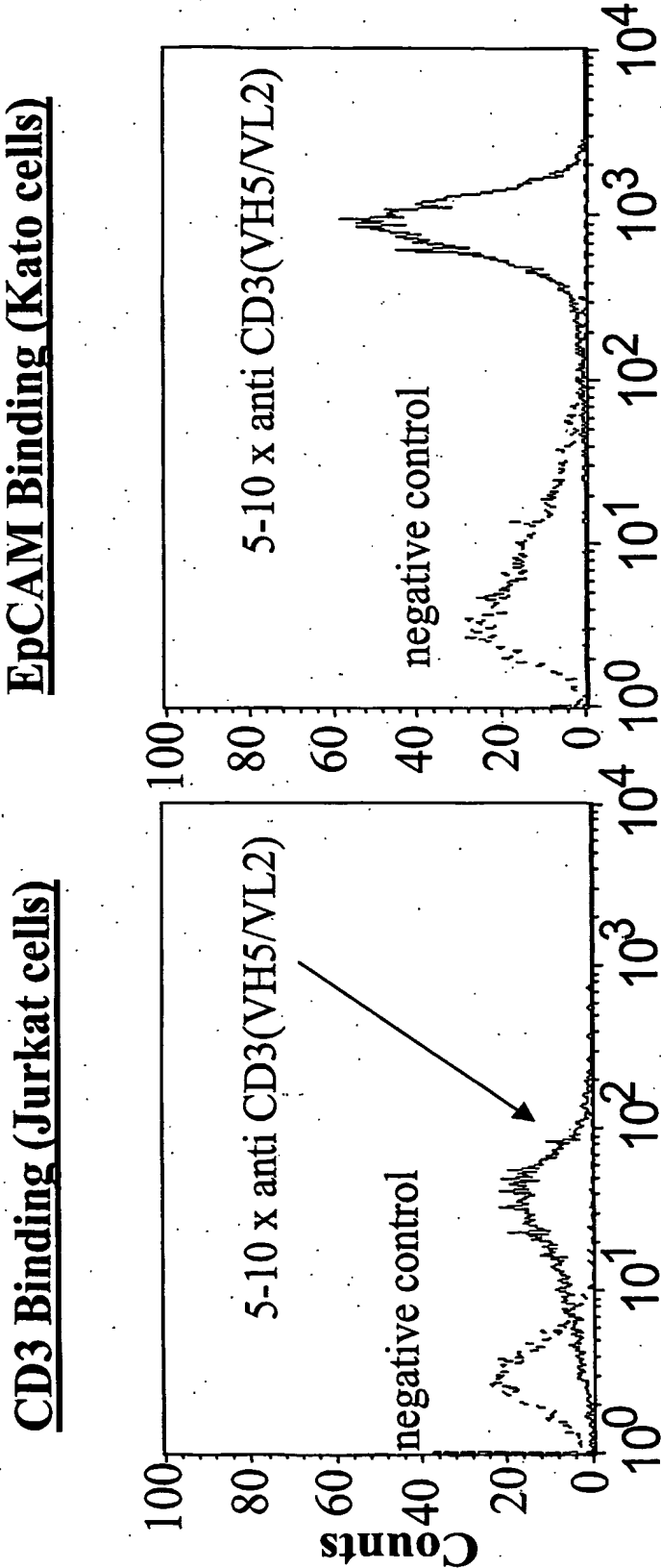
CD3 Binding (Jurkat cells)

EpCAM Binding (Kato cells)



3-1 x
antiCD3(VH5/VL2)
(SEQ ID NO: 49)

Figure 16 B



5-10 x antiCD3(VH5/VL2)
(SEQ ID NO:63)

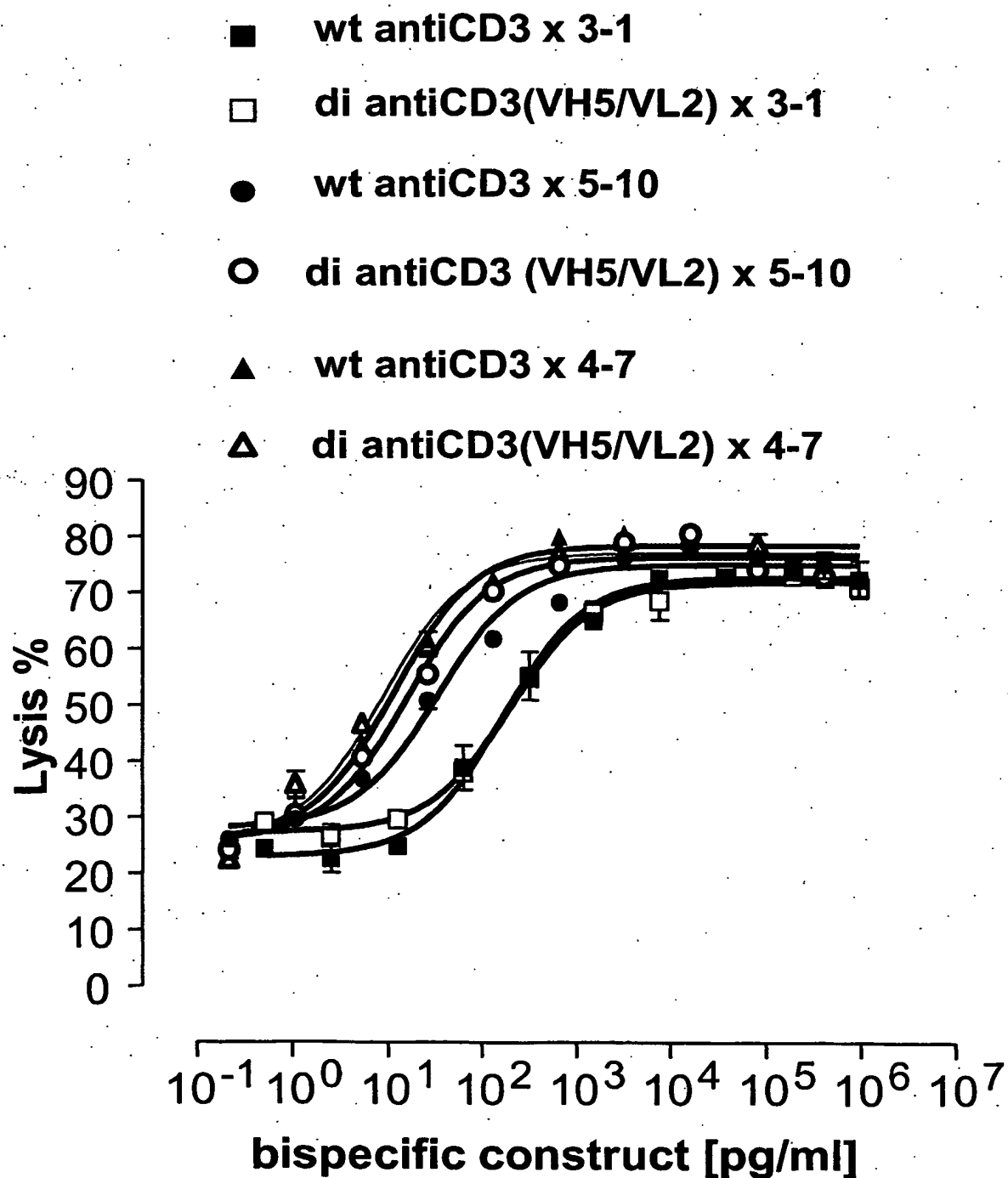
Figure 17

Figure 18